

LIST OF LLNL DESIGNATED CARCINOGENS

**Prepared by
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DOE requires that all the materials on this list receive special treatment as workplace carcinogens. Use this list with Health and Safety Supplement 21.16 and the support of your ES&H Team Industrial Hygienist to determine what specific precautions must be used in each instance. A longer list of chemical carcinogens, including those not regulated in the work place, is also available; if interested, contact Industrial Hygiene, L-384 for a copy.

The evaluations done by each of the listed organizations do not always correlate. Refer to each group's documentation and the original literature whenever additional information about carcinogenic potency is desired.

THE LIST WILL BE UPDATED ANNUALLY. IF THIS LIST IS OUTDATED, CONTACT THE INDUSTRIAL HYGIENE GROUP (L-384) FOR THE MOST CURRENT VERSION.

Organizations and Their Classification Systems
IARC: International Agency for Research on Cancer, World Health Organization

Group 1—The agent (mixture, exposure circumstance) is carcinogenic to humans.

Group 2A—The agent (mixture, exposure circumstance) is probably carcinogenic to humans. There is “limited evidence” of carcinogenicity from studies in humans, and “sufficient evidence” of carcinogenicity in experimental animals.

Group 2B—The agent (mixture, exposure circumstance) is possibly carcinogenic to humans.

Group 3—The agent (mixture, exposure circumstance) is not classifiable as to its carcinogenicity to humans.

Group 4—The agent (mixture, exposure circumstance) is probably not carcinogenic to humans.

NTP: National Toxicology Program, US Department of Health and Human Services

Type 1—Substances or groups of substances, and medical treatments that are known to be carcinogenic. Known carcinogens are defined as those substances for which the evidence from human studies indicates that there is a causal relationship between exposure to the substance and human cancer.

Type 2—Substances or groups of substances, and medical treatments which may reasonably be anticipated to be carcinogens.

1. There is limited evidence of carcinogenicity from studies in humans, which indicates that causal interpretation is credible, but that alternative explanations, such as chance, bias or confounding, could not adequately be excluded, or
2. There is sufficient evidence of carcinogenicity from studies in experimental animals which indicates that there is an increased incidence of malignant tumors: (a) in multiple species or strains, or (b) in multiple experiments (preferably with different routes of administration or using different dose levels), or (c) to an unusual degree with regard to incidence, site or type of tumor, or age at onset. Additional evidence may be provided by data concerning dose-response effects, as well as information on mutagenicity or chemical structure.

Type 3—Occupational exposures associated with a technological process that are known to be carcinogenic.

Type 4—Delisted substances; based on absence from US distribution and production, or new evidence or re-evaluation of existing data.

OSHA: Occupational Safety and Health Administration, US Department of Labor

Emphasis is on chemicals with industrial significance.

- R means regulated by Federal and California OSHA.
- C means regulated by California OSHA only.
- S means select carcinogen

OSHA “select carcinogens” are substances that meet one of the following:

- Regulated by OSHA as a carcinogen.
- NTP Type 1.
- IARC Group 1.
- IARC Group 2 or NTP Type 2, and causes statistically significant tumor incidence in experimental animals according to the following criteria:
 1. After inhalation exposure of 6 to 7 hours per day, 5 days per week for a significant portion of a lifetime, to dosages of less than 10 mg/m³.
 2. After repeated skin application of less than 300 mg/kg of body weight per week.
 3. After oral dosages of less than 50 mg/kg of body weight per day.

ACGIH: American Conference of Governmental Industrial Hygienists

Type 1—Confirmed Human Carcinogens. The agent is carcinogenic to humans based on the weight of evidence from epidemiologic studies of, or convincing clinical evidence in, exposed humans.

Type 2—Suspected Human Carcinogens. The agent is carcinogenic in experimental animals at dose levels, by route(s) of administration, at site(s), of histologic types(s), or by mechanism(s) that are considered relevant to worker exposure. Available epidemiologic studies are conflicting or insufficient to confirm an increased risk of cancer in exposed humans.

Type 3—Animal carcinogen. The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) that are not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

Type 4—Not Classifiable as a Human Carcinogen. There are inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

Type 5—Not suspected as a Human Carcinogen. The agent is not suspected to be a human carcinogen on the basis of properly conducted epidemiologic studies in humans. These studies have sufficiently long follow-up, reliable exposure histories, sufficiently high dose, and adequate statistical power to conclude that exposure to the agent does not convey a significant risk of cancer to humans. Evidence suggesting a lack of carcinogenicity in experimental animals will be considered if it is supported by other relevant data.

CAL: Chemicals Known to Cause Cancer, California Health and Welfare Agency

- Chemicals, processes, and exposure conditions that are carcinogenic. Prepared under direction from Proposition 65.

DESIGNATED CARCINOGENS

Revised November 1997

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Acetaldehyde	75-07-0	2B	2	—	3	X
	Acetophenetidide (phenacetin)	62-44-2	2A	2	S	—	X
2-	Acetylaminofluorene (N-fluoren-2-YL Acetamide)	53-96-3	—	2	R,S	—	X
	Acrylamide	79-06-1	2A	2	S	3	X
	Acrylonitrile	107-13-1	2A	2	R,S	2	X
	Actinolite (Asbestos)	13768-00-8	2A	1	R,S	—	—
	Actinomycin L	102488-94-3	2A	—	—	—	—
	Actinomycin S	12623-78-8	2A	—	—	—	—
	Adriamycin	23214-92-8	2A	2	—	—	X
	AF-2 ([2-(2-furyl)-3-(5-nitro-2-furyl)] acrylamid	3688-53-7	2B	—	S	—	X
	Aflatoxins	1402-68-2	1	1	S	—	X
	Aflatoxin B1	1162-65-8	1	—	S	—	—
	Aflatoxin B2	7220-81-7	1	—	S	—	—
	Aflatoxin G1	1165-39-5	1	—	S	—	—
	Aflatoxin G2	7241-98-7	1	—	S	—	—
	Aflatoxin M1	6795-23-9	2B	—	S	—	—
	Aluminum production industry	SEQ NO-40-2	1	—	S	—	—
1-	Amino-2-methylantraquinone	82-28-0	3	2	—	—	X
2-	Amino-5-(5-nitro-2-furyl)-1,3,4-thiadiazole	712-68-5	2B	—	S	—	X
2-	Aminoanthraquinone (beta-aminoanthraquinone)	117-79-3	3	2	—	—	X
o-	Aminoazotoluene	97-56-3	2B	2	S	—	X
4-	Aminodiphenyl	92-67-1	1	1	R,S	1	X
	Amitrole	61-82-5	2B	2	S	3	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Amosite (Asbestos)	12172-73-5	1	1	R,S	1	—
o-	Anisidine hydrochloride	134-29-2	—	2	—	—	X
	Anthophyllite (Asbestos)	17068-78-9	1	1	R,S	—	—
	Antimony trioxide production	1309-64-4	2B	—	—	2	—
	Aramite	140-57-8	2B	4	S	—	X
	Aroclor 1260	11096-82-5	—	2	—	—	—
	Arsenic and certain arsenic compounds	7440-38-2	1	1	R,S	1	X
	Arsenic pentoxide	1303-28-2	1	1	S	—	X
	Arsenic trioxide production	1327-53-3	1	1	S	2	—
	Arsine	7784-42-1	—	—	S	—	—
	Asbestos	1332-21-4	1	1	R,S	1	X
	Auramine base and auramine manufacture	492-80-8	1	—	S	—	X
1-	Aurothio-d-glucopyranose (Aurothioglucose)	12192-57-3	1	—	S	—	—
	Azacitidine	320-67-2	2A	2	—	—	X
	Azaserine	115-02-6	2B	—	S	—	X
	Azathioprine	446-86-6	1	1	S	—	X
	Barium chromate	10294-40-3	1	1	S	—	—
	Benzene	71-43-2	1	1	R,S	1	X
	Benzene hexachloride (Lindane)	608-73-1	2B	2	—	—	X
	Benzidine and its salts	92-87-5	1	1	R,S	1	X
	Benzotrichloride (alpha-chlorinated toluenes)	98-07-7	2B	2	S	2	X
	Benzo[a]pyrene	50-32-8	2A	2	S	2	X
	Benzo[b]fluoranthene	205-99-2	2B	2	S	2	X
	Benzo[j]fluoranthene	205-82-3	2B	2	S	—	X
	Benzo[k]fluoranthene	207-08-9	2B	2	S	—	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Benzylchloride	100-44-7	2B	—	S	3	X
	Benz[a]anthracene	56-55-3	2A	2	S	2	X
	Beryl (Beryllium compound)	1302-52-9	2A	2	—	2	—
	Beryllium aluminum alloy	12770-50-2	2A	2	—	2	—
	Beryllium and beryllium compounds	7440-41-7	1	2	S	1	X
	Beryllium carbonate	66104-24-3	2A	2	—	1	—
	Beryllium chloride	7787-47-5	2A	2	—	1	—
	Beryllium fluoride	7787-49-7	2A	2	—	1	—
	Beryllium hydrogen phosphate	13598-15-7	2A	2	—	1	—
	Beryllium hydroxide	13327-32-7	2A	2	—	1	—
	Beryllium oxide	1304-56-9	2A	2	—	1	—
	Beryllium sulfate	13510-49-1	2A	2	—	1	—
	Beryllium sulfate tetrahydrate	7787-56-6	2A	2	—	1	—
	Beryllium zinc silicate	39413-47-3	2A	2	—	1	—
	Betel tobacco extract	—	1	—	S	—	X
	Boot and shoe manufacture (certain occupations)	SEQ NO-39-9	1	—	S	—	—
	Bromodichloromethane	75-27-4	—	2	—	—	X
1,3-	Butadiene	106-99-0	2A	2	—	2	X
1,4-	Butanediol dimethanesulphonate (Myleran)	55-98-1	1	1	S	—	X
	Butylated hydroxyanisole	25013-16-5	2B	2	—	—	X
	C.I. Basic Red 9 (p-Rosaniline)	569-61-9	—	2	S	—	X
	C.I. Direct Black 38 (Benzidine based dye)	1937-37-7	2A	2	S	—	X
	C.I. Direct Blue 6 (Benzidine based dye)	2602-46-2	2A	2	—	—	X
	C.I. Direct Brown 95 (Benzidine based dye)	16071-86-6	2A	—	—	—	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	C.I. Disperse Orange 11 (1-Amino-2-methylantraquinone)	82-28-0	2B	2	—	—	X
	Cadmium and certain cadmium compounds	7440-43-9	1	2	R,S	2	X
	Cadmium chloride	10108-64-2	2A	2	R,S	—	—
	Cadmium chromate	13765-19-0	—	—	—	2	—
	Cadmium oxide	1306-19-0	—	2	R,S	—	—
	Cadmium sulfate	10124-36-4	2A	2	R,S	—	—
	Cadmium sulfide	1306-23-6	2A	2	R,S	—	—
	Caffeic acid	331-39-5	2B	—	S	—	X
	Calcium chromate	13765-19-0	1	1	S	2	—
	Calcium chromate dihydrate	8012-75-7	2A	—	—	—	—
	Captafol	2425-06-1	2A	—	—	4	X
	Carbon tetrachloride	56-23-5	2B	2	S	2	X
	Chemotherapy for lymphomas (including MOPP)	SEQ NO- 5-0	1	—	S	—	X
	Chlorambucil	305-03-3	1	1	S	—	X
	Chloramphenicol	56-75-7	2A	—	S	—	X
	Chlorendic acid	115-28-6	2B	2	—	—	X
	Chlorinated parafins (C12, 60% chlorine)	108171-26-2	2B	2	—	—	X
	Chlornaphazine	494-03-1	1	—	S	—	X
p-	Chloroaniline	106-47-8	2B	—	S	—	X
3-	Chloro-2-methylpropene	563-47-3	3	2	—	—	X
4-	Chloro-o-phenylenediamine	95-83-0	2B	2	—	—	X
p-	Chloro-ortho-toluidine	95-69-2	2A	2	—	—	X
1-(2-	Chloroethyl)-3-(4-methylcyclohexyl)-1-nitrosourea	13909-09-6	1	1	S	—	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
1-(2-	Chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU)	13010-47-4	2A	2	S	—	X
	Bis(2-chloroethyl)-2-naphthylamine	494-03-1	1	—	S	—	X
	Bis(2-chloroethyl)methylamine HCl	55-86-7	—	2	—	—	—
	Bis(2-chloroethyl)sulfide	505-60-2	1	1	S	—	X
	Bis-chloroethyl nitrosourea	154-93-8	2A	2	S	—	X
	Bis-chloromethyl ether	542-88-1	1	1	R,S	1	X
	Chloroform	67-66-3	2B	2	S	3	X
	Chloromethyl methyl ether	107-30-2	1	1	R,S	2	X
	Chlorozotocin	54749-90-5	2A	2	—	—	X
	Chromite ore processing	7440-47-3	1	1	S	1	—
	Chromium (VI) and certain chromium compounds (hex)	7440-47-3	1	1	S	1	X
	Chromium trioxide	1333-82-0	1	1	S	—	—
	Chrysotile	12001-29-5	1	1	R,S	1	—
	Clonorchis sinensis (infection with)	—	2A	—	—	—	—
	Ciclosporin (Cyclosporin)	59865-13-3	1	1	S	—	X
	Cisplatin	15663-27-1	2A	2	—	—	X
	Coal gasification	SEQ NO-40-3	1	—	S	—	—
	Coal soot (occupational exposure)	SEQ NO- 7-0	1	3	S	—	—
	Coal tar pitches	65996-93-2	1	3	S	1	—
	Coal tars (occupational exposure)	8007-45-2	1	3	S	—	—
	Coke oven emissions	SEQ NO- 7-5	1	3	R,S	—	X
	Coke production	SEQ NO-40-4	1	—	S	—	—
	Copper aceto-arsenite (OSHA 1910.1018)	12002-03-8	1	1	R,S	—	—
	Creosote(s)	8001-58-9	2A	3	—	—	X
p-	Cresidine	120-71-8	2B	2	—	—	X
	Crocidolite asbestos	12001-28-4	1	1	R,S	1	—

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Cummingtonite-grunerite	SEQ NO-37-3	—	1	S	—	—
	Cupferron	135-20-6	—	2	—	—	X
	Cutting oils (occupational exposure)	SEQ NO-36-1	1	3	S	—	—
	Cycasin	14901-08-7	2B	4	S	—	X
	Cyclophosphamide	50-18-0	1	1	S	—	X
	Dacarbazine	4342-03-4	2B	2	S	—	X
	Danthron (Chrysazin)	117-10-2	2A	2	—	—	X
	DDT (Dichlorodiphenyltrichloroethane)	50-29-3	2B	2	S	—	X
	Di(2-ethylhexyl)phthalate	117-81-7	2B	2	—	—	X
N,N'	Diacetylbenzidine	613-35-4	2B	—	S	—	X
2,4-	Diaminoanisole Sulfate	39156-41-7	—	2	—	—	X
4,4'	Diamimodiphenyl ether (IARC) (4,4'-oxydianiline)	101-80-4	2B	2	S	—	X
2,4-	Diaminotoluene	95-80-7	2B	2	S	—	X
	Diazomethane	334-88-3	—	—	—	2	—
	Dibenzo[a,e]pyrene	192-65-4	2B	2	S	—	X
	Dibenzo[a,h]pyrene	189-64-0	2B	2	S	—	X
	Dibenzo[a,i]pyrene	189-55-9	2B	2	S	—	X
	Dibenzo[a,l]pyrene	191-30-0	2B	2	S	—	X
7H-	Dibenzo[c,g]carbazole	194-59-2	2B	2	S	—	X
	Dibenz[a,h]acridine	226-36-8	2B	2	S	—	X
	Dibenz[a,h]anthracene	53-70-3	2A	2	S	—	X
	Dibenz[a,j]acridine	224-42-0	2B	2	S	—	X
1,2-	Dibromo-3-chloropropane	96-12-8	2B	2	R,S	—	X
1,4-	Dichloro-2-butene	764-41-0	3	—	—	2	X
p-	Dichlorobenzene	106-46-7	2B	2	—	3	X
3,3'	Dichlorobenzidine	91-94-1	2B	2	R,S	3	X
1,3-	Dichloropropene (Telone II)	542-75-6	2B	2	S	4	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Diepoxybutane	1464-53-5	2B	2	—	—	X
	Diethyl sulfate	64-67-5	2A	2	S	—	X
	Diethylstilbestrol	56-53-1	1	1	S	—	X
	Diglycidyl resorcinol ether	101-90-6	2B	2	S	—	X
3,3'	Dimethoxybenzidine	119-90-4	2B	2	S	—	X
3,3'	Dimethylbenzidine	119-93-7	—	2	—	—	—
	Dimethyl sulfate	77-78-1	2A	2	—	3	X
4-	Dimethylaminoazobenzene	60-11-7	2B	2	R,S	—	X
	Dimethylcarbamoyl chloride	79-44-7	2A	2	S	2	X
1,1-	Dimethylhydrazine	57-14-7	2B	2	S	3	X
1,2-	Dimethylhydrazine	540-73-8	2B	—	S	—	X
	Dimethylvinyl chloride	513-37-1	2B	2	—	—	X
1,6-	Dinitropyrene	42397-64-8	2A	2	—	—	X
1,8-	Dinitropyrene	42397-65-9	2A	2	—	—	X
2,4-	Dinitrotoluene	121-14-2	—	—	—	2	X
1,4-	Dioxane	123-91-1	2B	2	S	3	X
	Disperse Blue 1	2475-45-8	2A	2	—	—	X
	Epichlorohydrin	106-89-8	2A	2	—	3	X
	Erionite	66733-21-9	1	1	S	—	X
	Estradiol 17B	50-28-2	1	2	S	—	X
	Estrogens, conjugated	SEQ NO-24-0	1	1	S	—	—
	Estrogens, steroidal and nonsteroidal	—	1	—	S	—	—
	Estrone	53-16-7	1	2	S	—	X
	Ethinylestradiol	57-63-6	1	2	S	—	X
	Ethyl acrylate	140-88-5	2B	2	—	2	X
	Ethyl carbamate (Urethane)	51-79-6	2B	2	—	—	X
	Ethyl methanesulfonate	62-50-0	2B	2	S	—	X
	Ethylene dibromide	106-93-4	2A	2	C,S	3	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Ethylene dichloride	107-06-2	2B	2	S	4	X
	Ethylene oxide	75-21-8	1	2	R,S	2	X
	Ethylene thiourea	96-45-7	2B	2	S	—	X
	Ethyleneimine	151-56-4	—	—	R,S	3	X
	Formaldehyde	50-00-0	2A	2	R,S	2	X
	Furan	110-00-9	2A	2	—	—	X
	Furniture manufacture	SEQ NO-40-0	1	—	S	—	—
	Glass, manufacture of art glass, containers, and pressed ware	—	2A	—	S	—	—
	Glasswool fibers (airborne particles of respirable size)	—	—	2	—	3	X
	Glu-P-1 (2-amino-6-methyldipyrido [1,2-a:3',2'-d]	67730-11-4	2B	—	S	—	X
	Glu-P-2 (2-aminodipyrido [1,2-a:3',2'-d] indole	67730-10-3	2B	—	S	—	X
	Glycidol	556-52-5	—	2	—	3	X
	Helicobacter pylori (infection with)	—	1	—	—	—	—
	Hepatitis B virus (chronic infection with)	—	1	—	—	—	—
	Hepatitis C virus (chronic infection with)	—	1	—	—	—	—
	Hematite underground mining	1317-60-8	1	—	S	—	—
	Hexachlorobenzene	118-74-1	2B	2	S	3	X
	Hexachlorocyclohexane (mixed isomers)	608-73-1	2B	2	—	—	X
	Hexachlorethane	67-72-1	—	2	—	3	X
	Hexamethylphosphoramide	680-31-9	2B	2	S	3	X
	Human immunodeficiency virus (HIV) type 1 (infection with)	—	1	—	—	—	—
	Human papillomavirus type 16	—	1	—	—	—	—
	Human papillomavirus type 18	—	1	—	—	—	—

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Human papillomavirus type 31	—	2A	—	—	—	—
	Human papillomavirus type 33	—	2A	—	—	—	—
	Human T-cell lymphotropic virus type I	—	1	—	—	—	—
	Hydrazine	302-01-2	2B	2	S	3	X
	Hydrazine sulfate	10034-93-2	—	2	S	—	X
	Hydrazobenzene	122-66-7	—	2	S	—	X
	Indeno[1,2,3-cd]pyrene	193-39-5	2B	2	S	—	X
	IQ, (2-Amino-3-methylimidazo[4,5-f]quinoline)	76180-96-6	2A	—	S	—	X
	Iron and steel founding	SEQ NO-40-5	1	—	S	—	—
	Iron dextran complex	9004-66-4	2B	2	—	—	X
	Isopropyl alcohol manufacture (strong-acid process)	67-63-0	1	—	S	—	—
	Kepone (Chlordecone)	143-50-0	2B	2	S	—	X
	Lasiocarpine	303-34-4	2B	—	S	—	X
	Lead acetate	301-04-2	2B	2	S	—	X
	Lead chromate	7758-97-6	1	1	S	2	—
	Lead chromate (VI) oxide	18454-12-1	1	1	S	—	—
	Lead phosphate	7446-27-7	2B	2	S	—	X
alpha-	Lindane (alpha-hexachlorocyclohexane)	319-84-6	2B	2	S	—	X
	Lindane (gamma-hexachlorocyclohexane)	58-89-9	2B	2	S	3	X
beta-	Lindane, mixed isomers (beta-hexachlorocyclohexane)	319-85-7	2B	2	S	—	X
	Magenta I	632-99-5	1	—	S	—	—
	Magenta II	26261-57-4	1	—	S	—	—
	Magenta III	3248-91-7	1	—	S	—	—
	Melphalan	148-82-3	1	1	S	—	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Mercury, methyl mercury compounds	—	2B	—	S	—	—
	Mestranol	72-33-3	1	2	S	—	X
5-	Methoxypsoralen with ultraviolet A therapy	484-20-8	2A	—	—	—	X
8-	Methoxypsoralen with ultraviolet A therapy (PUVA)	298-81-7	1	1	S	—	X
	Methyl chloromethyl ether (chloromethyl methyl ether)	107-30-2	1	1	R,S	2	X
	Methyl iodide	74-88-4	3	4	—	2	X
	Methyl methanesulfonate	66-27-3	2B	2	S	—	X
2-	Methyl-1-nitroanthraquinone	129-15-7	2B	—	S	—	X
N-	Methyl-N'-nitro-N-nitrosoguanidine	70-25-7	2A	2	S	—	X
	Methyl-N-nitrosourea	684-93-5	2A	—	—	—	—
N-	Methyl-N-nitrosourethane	650-53-2	2B	—	S	—	—
2-	Methylaziridine (propyleneimine)	75-55-8	2B	2	S	3	X
	Methylazoxymethanol	590-96-5	2B	—	S	—	X
	Methylazoxymethanol acetate	592-62-1	2B	—	S	—	X
5-	Methylchrysene	3697-24-3	2B	2	S	—	X
4,4'	Methylene bis(2-chloroaniline)	101-14-4	2A	2	C,S	2	X
4,4'	Methylene bis(N,N-dimethyl)benzeneamine	101-61-1	—	2	S	—	X
	Methylene chloride (Dichloromethane)	75-09-2	2B	2	R	3	X
4,4'	Methylenedianiline	101-77-9	2B	2	R,S	3	X
4,4'	Methylenedianiline dihydrochloride	13552-44-8	—	2	R,S	—	X
	Methylthiouracil	56-04-2	2B	—	S	—	X
	Metronidazole	443-48-1	2B	2	S	—	X
	Michler's ketone	990-94-8	—	2	S	—	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Mineral oils (containing various additives and impurities)	8002-05-9	1	3	S	—	—
	Mirex	2385-85-5	2B	2	S	—	X
	Mustard gas	505-60-2	1	1	S	—	X
alpha-	Naphthylamine (1-Naphthylamine)	134-32-7	3	—	R,S	—	X
beta-	Naphthylamine (2-Naphthylamine)	91-59-8	1	1	R,S	1	X
	Nickel and certain nickel compounds	7440-02-0	1	2	S	—	X
	Nickel carbonate	3333-67-3	1	2	S	—	—
	Nickel carbonyl	13463-39-3	1	2	S	—	X
	Nickel hydroxide	12054-48-7	1	2	S	—	—
	Nickel oxide	1313-99-1	1	2	S	—	—
	Nickel refining	—	1	—	S	—	X
	Nickel subsulfide	12035-72-2	1	2	S	—	X
	Nickel sulfide roasting	—	1	—	S	1	—
	Nickelocene	1271-28-9	1	2	S	—	—
	Nickle acetate	373-02-4	1	2	S	—	—
	Niridazole	61-57-4	2B	—	S	—	X
N-[4-(5-	Nitro-2-furyl)-2-thiazolyl]acetamide	531-82-8	2B	—	S	—	X
o-	Nitroanisole	91-23-6	2A	2	—	—	X
4-	Nitrobiphenyl	92-93-3	3	—	R,S	2	X
6-	Nitrochrysene	7496-02-8	2A	2	—	—	X
	Nitrofen	1836-75-5	2B	2	—	—	X
	Nitrogen mustard	51-75-2	2A	2	—	—	X
	Nitrogen mustard hydrochloride	55-86-7	—	2	S	—	X
2-	Nitropropane	79-46-9	2B	2	S	3	X
1-	Nitropyrene	5522-43-0	2A	2	—	—	X
4-	Nitropyrene	57835-92-4	2A	2	—	—	X
N-	Nitroso-N-ethylurea	759-73-9	—	2	S	—	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
N-	Nitroso-N-methylurea	684-93-5	2A	2	S	—	X
N-	Nitrosodi-n-butylamine	924-16-3	2B	2	S	—	X
N-	Nitrosodi-n-propylamine	621-64-7	2B	2	S	—	X
N-	Nitrosodiethanolamine	1116-54-7	2B	2	S	—	X
N-	Nitrosodiethylamine	55-18-5	2A	2	S	—	X
N-	Nitrosodimethylamine	62-75-9	2A	2	R,S	3	X
4-(N-	Nitrosodimethylamino)-1-(3-pyridyl)-1-butanone (N)	64091-91-4	2B	2	—	—	X
N-	Nitrosomethylethylamine	10595-95-6	2B	—	S	—	X
N-	Nitrosomethylvinylamine	4549-40-0	2B	2	S	—	X
N-	Nitrosomorpholine	59-89-2	2B	2	S	—	X
N-	Nitrosonornicotine	16543-55-8	2B	2	—	—	X
N-	Nitrosopiperidine	100-75-4	2B	2	S	—	X
N-	Nitrosopyrrolidine	930-55-2	2B	2	S	—	X
N-	Nitrososarcosine	13256-22-9	2B	2	—	—	X
	Norethisterone	68-22-4	2B	2	—	—	X
	Ochratoxin A	303-47-9	2B	2	S	—	X
	Oestrogens, nonsteroidal (This evaluation applies to the group as a whole and not necessarily to all individual compounds within the group.)	—	1	—	—	—	—
	Oestrogens, steroidal (This evaluation applies to the group as a whole and not necessarily to all individual compounds within the group.)	—	1	—	—	—	—
	Oil shale soot-extracts	SEQ NO-24-1	1	—	S	—	—
	Opisthorchis viverrini (infection with)	—	1	—	—	—	—

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Oral contraceptives, combined	SEQ NO-24-2	1	—	S	—	X
	Oral contraceptives, sequential	SEQ NO-24-3	1	—	S	—	X
4,4'	Oxydianiline (4,4' Diaminodiphenyl ether)	101-80-4	2B	2	S	—	X
	Oxymetholone	434-07-1	1	2	S	—	X
	Pentachlorophenol (occupational exposure)	87-86-5	2B	—	S	3	X
	Phenacetin, and analgesic mixtures with phenacetin	62-44-2	2A	2	S	—	X
	Phenazopyridine	94-78-0	—	2	—	—	X
	Phenazopyridine hydrochloride	136-40-3	2B	2	—	—	X
	Phenobarbital	50-06-6	2B	—	S	—	X
	Phenoxybenzamine hydrochloride	63-92-3	2B	2	—	—	X
	Phenytoin	57-41-0	2B	2	S	—	X
	Phenytoin, sodium salt of	630-93-3	2A	—	—	—	X
	Polybrominated biphenyls	67774-32-7	2B	2	—	—	X
	Polychlorinate biphenyls	1336-36-3	2A	2	S	—	X
	Potassium bromate	7758-01-2	2B	—	S	—	X
	Procarbazine	671-16-9	—	2	—	—	X
	Procarbazine hydrochloride	366-70-1	—	2	S	—	X
	Progesterone (Progrestins)	57-83-0	2B	2	—	—	X
1,3-	Propane sultone	1120-71-4	2B	2	S	3	X
beta-	Propiolactone	57-57-8	2B	2	R,S	3	X
	Propylene oxide	75-56-9	2B	2	S	3	X
	Propylthiouracil	51-52-5	2B	2	—	—	X
	Radon	10043-92-2	—	1	S	—	—
	Rubber industry (certain occupations)	SEQ NO-40-1	1	—	S	—	—
	Saccharin	81-07-2	2B	2	—	—	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Safrole	94-59-7	2B	2	—	—	X
	Salted fish, Chinese style	—	1	—	S	—	—
	Schistosoma haematobium (infection with)	—	1	—	—	—	—
	Selenium sulfide (SeS)	7446-34-6	—	2	S	—	X
	Shale oils, bitumens	SEQ NO-28-1	1	—	S	—	—
	Shale oils, commerical blends	SEQ NO-28-2	1	—	S	—	X
	Shale oils, crude	68308-34-9	1	3	S	—	X
	Shale oils, crude--distillation fractions	SEQ NO-28-3	1	—	S	—	—
	Shale oils, crude--high temperature and fractions	SEQ NO-28-4	1	—	S	—	—
	Shale oils, crude--low temperature	SEQ NO-28-5	1	—	S	—	—
	Silica, crystalline (airborne particles of respirable size)	—	1	2	—	—	X
	Sodium arsenate (arsenic compounds)	7631-89-2	1	1	R,S	—	—
	Sodium arsenite (Arsenic compounds)	7784-46-5	1	1	R,S	—	—
	Sodium saccharin	128-44-9	2B	2	—	—	X
	Soots, tars and mineral oils (occupational exposure)	SEQ NO-29-1	1	3	S	—	X
	Streptozotocin	18883-66-4	2B	2	—	—	X
	Strontium chromate	7789-06-2	1	1	S	2	—
	Styrene oxide	96-09-3	2A	—	—	—	X
	Sulfallate	95-06-7	2B	2	S	—	X
	Sulfuric acid	7664-93-9	—	—	—	2	—
	Talc, containing asbestos fibers	—	1	—	S	—	X
	Tamoxifen and its salts	10540-29-1	1	—	—	—	X
	Testosterone (Androgenic anabolic steroids)	58-22-0	2A	—	—	—	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
2,3,7,8-	Tetrachlorodibenzo-p-dioxin	1746-01-6	1	2	S	—	X
	Tetrachloroethylene (Perchloroethylene)	127-18-4	2A	2	—	3	X
	Tetranitromethane	509-14-8	2B	2	—	3	X
	Thioacetamide	62-55-5	2B	2	S	—	X
	Thiotepa	52-24-1	1	1	S	—	X
	Thiourea	62-56-6	2B	2	S	—	X
	Thorium dioxide	1314-20-1	—	1	S	—	X
	Tobacco smoke	—	1	—	S	—	X
	Tobacco, oral use of smokeless products	—	1	—	S	—	X
o-	Tolidine (3,3'-dimethylbenzidine)	119-93-7	2B	2	—	3	X
	Toluene-2,4-diisocyanate	548-84-9	2B	2	—	4	X
o-	Toluidine	95-53-4	2B	2	S	3	X
o-	Toluidine hydrochloride	636-21-5	—	2	—	—	X
	Toxaphene	8001-35-2	2B	2	S	3	X
	Tremolite (Asbestos)	14567-73-8	1	1	R,S	—	—
	Treosulphan	299-75-2	1	—	S	—	X
	Trichloroethylene	79-01-6	2A	—	—	5	X
2,4,6-	Trichlorophenol (chlorophenol)	88-06-2	2B	2	—	—	X
2,4,5-	Trichlorophenoxy acetic acid (occupational exposure)	93-76-5	2B	—	S	—	—
1,2,3	Trichloropropene	96-18-4	2A	2	—	3	X
	Tris(2,3-dibromopropyl) phosphate	126-72-7	2A	2	S	—	X
	Tris(aziridinyl)-phosphine sulfide	52-24-4	2A	2	—	—	X
	Trp-P-1 (Tryptophan-P-1)	62450-06-0	2B	—	S	—	X
	Trp-P-2 (Tryptophan-P-2)	62450-07-1	2B	—	S	—	X
	Urethane (ethyl carbamate)	51-79-6	2B	2	—	—	X
	Vinyl bromide	593-60-2	2A	—	—	2	X
	Vinyl chloride	75-01-4	1	1	R,S	1	X

Designated Carcinogens (cont'd)

PREFIX	MATERIAL	CAS NUMBER	IARC	NTP	OSHA	ACGIH	CAL
	Vinyl cyclohexene dioxide	106-87-6	2B	2	—	3	X
	Vinyl fluoride	75-02-5	2A	—	S	—	—
	Wood dust (certain hardwoods)	—	1	—	—	1	—
	Zinc chromate (Chromium and certain chromium compounds)	13530-65-9	1	1	S	1	—
	Zinc chromate hydroxide (Chromium and certain chromium compounds)	15930-94-6	1	1	S	—	—